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PIE

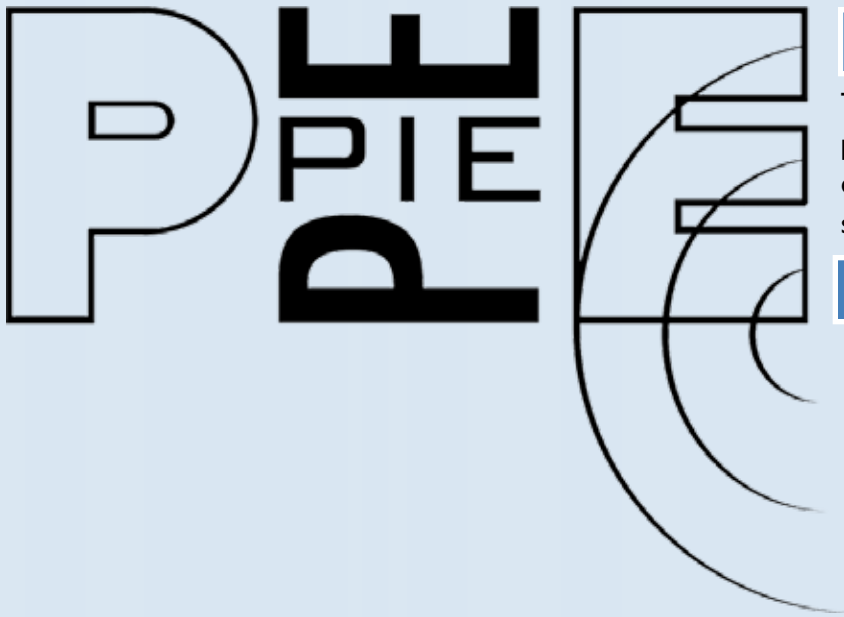
ATELIER DOCUMENTATION

**PIE WORKSHOP @
EXPLORA**

EXPLORA, ALBUQUERQUE, NEW MEXICO

MARCH 5 - 7, 2008





ATELIER DOCUMENTATION

The PIE Institute is a museum collaboration offering professional development opportunities for informal educators to explore new approaches to teaching science, art, and technology.

<http://www.exploratorium.edu/pie>

PIE WORKSHOP @ EXPLORA

March 5-7, 2008
Explora, Albuquerque, New Mexico

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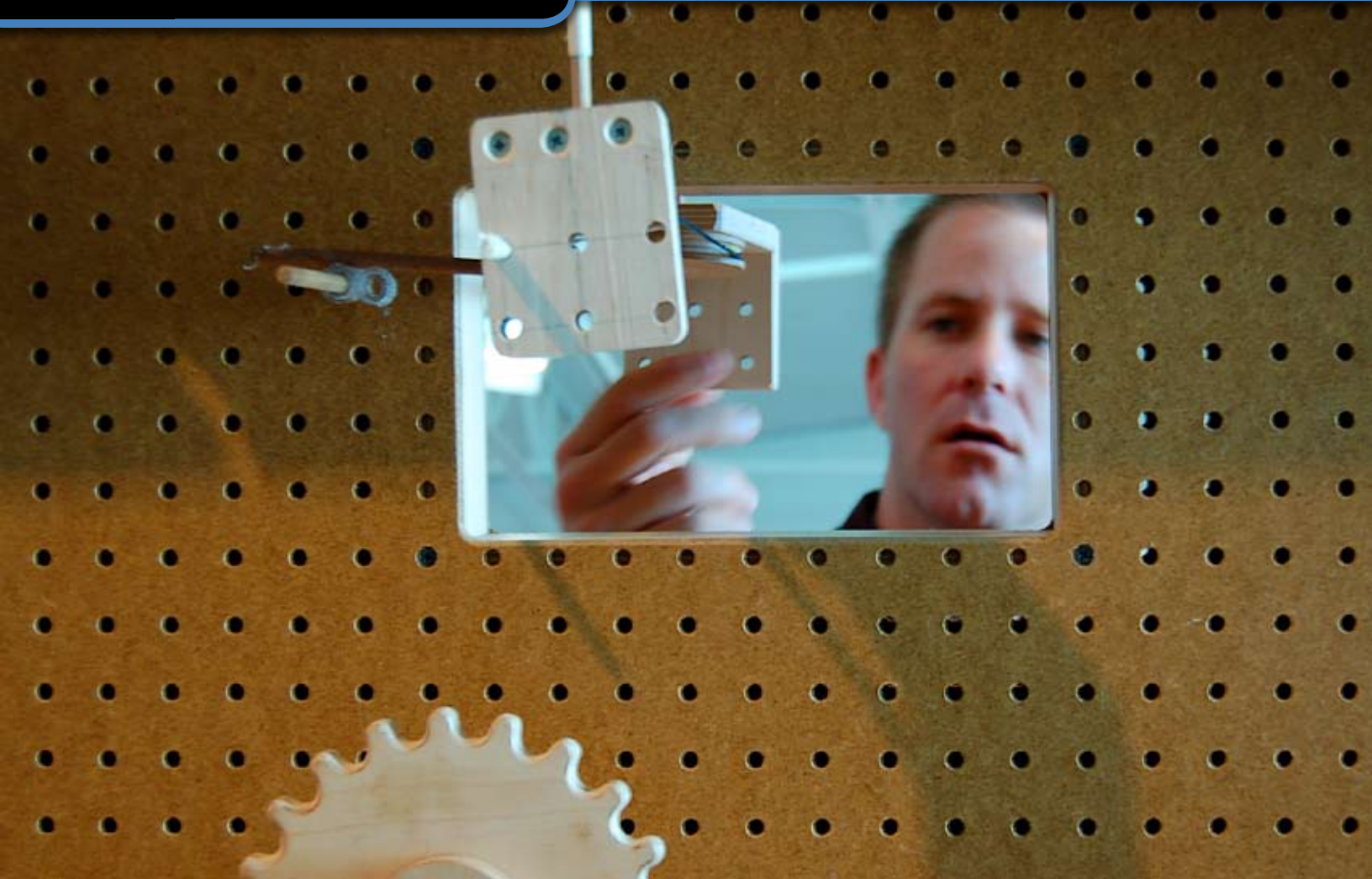
The PIE Workshop @ Explora

We explored the application of PIE ideas in a variety of science-rich exhibit and program activities. We experienced ways in which exhibit and program staff can work together on activities based on a shared educational philosophy: to support participant-driven thought and action, and to encourage transactions among people, within a person, and among people, physical materials and the environment. Activities included exhibit exploration, materials-based workshops and discussions.

a~te*lier
/n. [F] a workshop;
a studio for an artist
or designer.

PIE Institute Ateliers
explore new educational
activities utilizing digital
technologies, and provide
opportunities to share the
PIE philosophy of
teaching and learning.





Explore

- Systems in Motion/*Sistemas en movimiento*
- My Chain Reaction/*Mi reacción en cadena*

We explored two new exhibit areas of Explora, then debriefed the experience. We articulated process skills used, questions asked, variables manipulated, inferences made, and ways we made sense of the experience.



“Archeology” Workshop Part I

We discussed the role of the environment and materials in making sense of the “What’s in the Garbage” activity. Discussion topics included how we use our life experiences to make inferences about the people and places from which the garbage came.

“Archeology” Workshop Part II

We traveled to exhibit sections of Explora and, taking the perspective of an amateur archeologist, made inferences. Specifically, we looked at what inferences could be drawn regarding past activity at the exhibit, and what actions could be taken at the exhibit.



PIE in an Electricity Science Curriculum

We explored electricity activities from three popular Explora workshops. Discussions following the activity focused on facilitating the inquiry process.

Moving Facilitation from the Classroom to the Exhibit Floor

We compared/contrasted workshop facilitation with similar facilitation for exhibit activities by becoming Explora facilitators on the exhibit floor.





Inference and Experienced Analogs (Behavioral Inferencing)

Activities from Explora's programs and exhibits were the context for discussing incipient acts, acts that are at the heart of inquiry because they are the sources of the suggestions for inferences.



Articulating Exhibit/Program Connections

We were given time for activities and materials development with educators and exhibit developers.

Wrap-up and Reflection

We listened to each other and shared final thoughts about the workshop.

Workshop Goals

- Participate in a broad range of exhibit and educational program activities with a PIE-like perspective and attitude
- Look at the possible outcomes of using a consistent pedagogy across educational programs and exhibits and of collaborative relationships among exhibits and program staff members
- Consider the possibilities of transactive situations and relationships among people, materials, and environments
- Discuss learning spaces and the messy, complex activities and changing relationships that happen with and within them.

Workshop Context

Attention to the transactive relationships among people, materials, and environments can help us, as educators, make choices that will enhance visitors' opportunities to learn. We all use experiential analogs and make inferences based upon past and present activities or experiences. The environment, materials, and people all provide clues to activities that have taken place in the past, and offer suggestions for future activities.



WEDNESDAY OVERVIEW

Wednesday's Theme

The archeology of environments and experiences

Wednesday's Goals

Visit two exhibit areas, then debrief the exhibit experience. Connect the experiences to inferences that are made while taking action as a learner, and while exploring the archeology of a classroom or exhibit activity as a facilitator.



We explored the Systems in Motion/*Sistemas en movimiento*, and My Chain Reaction/*Mi reacción en cadena* exhibit areas. We messed around with the exhibits; then, we discussed the variety of ways that we made sense of the experience.

Discussion topics included how we made use of other people in the area, what experiences the activity reminded us of (experiential analogs), and what kinds of ideas occurred to us during the activities. Examples of participant comments during this discussion include:

- I worked separately, then connected with others.
- Staff redirected questions to physical resources.
- It reminded me of making tracks for marbles in my brother's bedroom.
- What I learned tended to occur when something didn't work.
- Some spaces seemed more individual, some social.

We spent the afternoon "digging in" to the archeology workshop, which got us thinking about what characteristics of materials help us draw out inferences about what others have previously done with them. As we combed through our "trash cans," we made inferences about the trash can's owner/s. To do this we drew upon our own experiential analogs and personal/group resources.

Examples of the experiential analogs mentioned by participants include: being an art student, keeping lists, being a mom, working to deadlines, seeing lots of movies. Examples of resources mentioned by participants include: conversations with partner, empathy, time, my senses, trusting my gut. We discussed how the physical materials and environments at Explora connect visitors' past and present activities and experiences and suggest possible courses of action.

That evening we attended a reception at which local high school students in AP physics shared their interactive art pieces, created as the culmination of a unit on the elements of circuit design.

The evening concluded with a performance of science songs by the Explora Band.



PARTICIPANT QUOTES

"The staff didn't ever tell me the answer, rather, they located my experience and pursued that path with me."

"The way that I got started was by taking one piece that I found interesting, then went from there."

"So much of what happens depends on characteristics of your personal life. You might have the exact same things in front of you then go in completely different directions."

"Objects change in their use depending on the person using it. Some [parts] are active and some passive in use. You don't know until you see how they work."

"We spend a lot of time making ourselves comfortable with others being frustrated."

"It feels like it [Explora/exhibits] is a work in progress."

Thursday's Theme

Educational program and exhibit activity facilitation

Thursday's Goal

Explore possibilities for inquiry through PIE-like activities; then, using facilitation techniques experienced in the classroom/workshop activity, compare and contrast the facilitation of visitors on the exhibit floor.

THURSDAY ACTIVITIES

After time to process the previous day, Thursday began with participants experiencing PIE-influenced activities in an electricity science curriculum. We created giant circuits with aluminum foil “wires”; explored electrical pathways with D cells, holiday lights, and alligator clips; and built and wired our own “houses,” which included a house for a mouse, a subterranean dwelling, a disco, and more.

During a post-activity discussion, we discussed the process of getting stuck/unstuck, making and testing inferences, and the role of other people in our learning. Examples of participant comments include:

- The holiday lights were easier than the bulbs, because they needed less batteries and were easier to manipulate.
- Graphite conducts!
- There was no guilt about “copying.”
- It’s interesting how so many different people approach things in so many different ways.
- Other people were sources of prior knowledge or examples.

In the afternoon we moved from the classroom to the exhibit floor to compare and contrast the facilitation methods. We discussed some techniques for facilitating the open-ended exhibit and program activities. Some of these included: setting the initial mood, providing the widest possible range of resources, acknowledging the student’s desire to make discoveries that are personally meaningful, remaining alert to expressions that indicate strong feelings, and becoming a participant learner. We put on Explora’s volunteer aprons and tried out these techniques with middle school students on the exhibit floor.

After the exhibit floor facilitation experience, we debriefed. Examples of participant comments during the debriefing include:

- A little boy came back to show me something.
- I stood back for awhile and smiled.
- People seemed comfortable—more so in groups.
- I observed myself, my own tolerance for frustration. I did the best thing by not doing a lot.
- What do these materials do? How am I going to attract someone?



PARTICIPANT QUOTES

“It’s interesting how so many different people approached things in so many different ways.”

“Getting stuck and unstuck is something we talk a lot about when we’re developing programs [and exhibits].”

“What we call knowledge is really a hope for the future; it’s not about the past.”

“Facilitators were like good gardeners.”

“There was an implicit trust that people would work out how to do things.”

Friday's Theme

Inferences and analogs in educational program and exhibit activities

Friday's Goals

Explore behavioral inferencing and make connections to Explora exhibits and activities. Reflect on the workshop and brainstorm PIE-related activities that could work in multiple contexts.

FRIDAY ACTIVITIES

The day started with a workshop on inference and experienced analogs, both in programs and on the exhibit floor. We walked in to a room full of trays of materials, including liquids of various densities and test tubes, graph paper and colored pencils, trays of dirt with worms and magnifiers, microscopes with various objects, Legos, and more. We messed around with the materials for awhile and then thought more carefully about where the impulses to touch these materials came from. Examples of participant comments include:

- We have hands—we need to use them.
- Biological urge
- You want to know what's hidden from you.

We discussed incipient acts and the nearly irrepressible urge to do something in particular, and the role the characteristics of the materials played. We thought about inferences made directly through behavior. We also thought about the mood of the room while we explored. Examples of participant comments include:

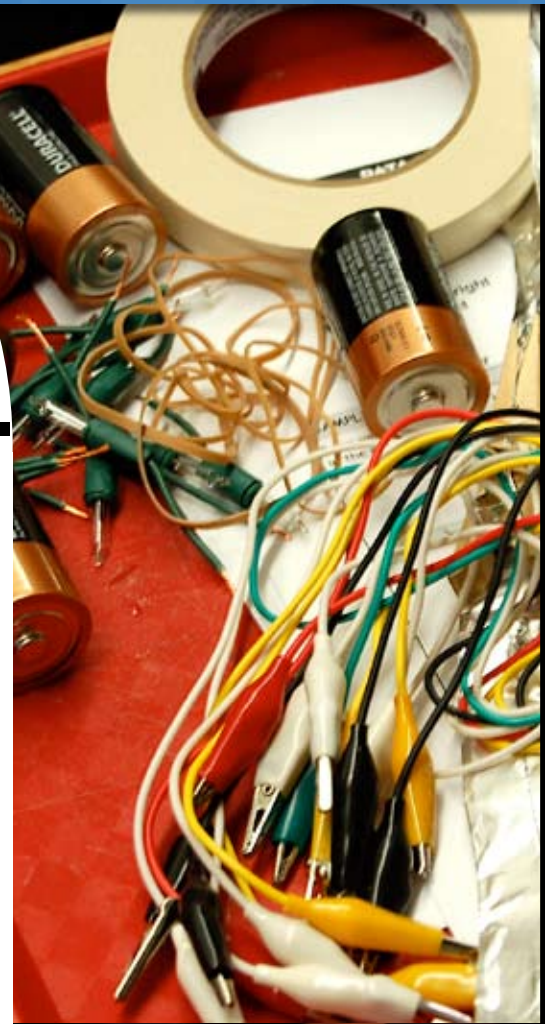
- Lots of clinking and clattering
- Laughter and conversation
- Volume increased
- Talking and asking questions
- Mouths open, surprise

We described prior experiences and experiential analogs that related to the materials. Comments included:

- Playing on the beach
- Pen rolling parabolically on my drawing table
- Buying silly putty for my daughter
- Making paper dolls

After time to explore different trays, we also discussed the process of making and testing inferences with the materials.

In the afternoon Explora staff spent some time describing the practical connections between exhibits and programs at Explora and their foundation in a shared pedagogy. Finally, we reflected on the past few days to brainstorm and develop PIE-related activities that might work in multiple contexts back at our own institutions.



Supplemental Materials

Browse the list below to download documents from the PIE Workshop at Explora. You can also review all of the Web sites referenced in the text of this document along with other connections we find inspiring.

WEB SITES

Explora www.explora.us
PIE Web site www.exploratorium.edu/pie

IMAGE GALLERY

VIEW AND DOWNLOAD IMAGES FROM THE

PIE WORKSHOP @ EXPLORA

GALLERY

www.exploratorium.edu/pie/gallery/explora



DOWNLOADS

Resources

- [Inquiry Spiral](#) (PDF 20 KB)
- [Explora's program criteria](#) (PDF 32 KB)
- [Explora's criteria for exhibits and exhibit environments](#) (PDF 32 KB)
- [PIE Workshop @ Explora Articles](#) (PDF 1.2 MB)
- [Workshop Schedule](#) (PDF 58 KB)
- [Workshop Participant List](#) (PDF 32 KB)
- [A Mole is a Unit](#) (PDF 56 KB)

